WHAT IS CLAIMED IS:

1. A method for efficient management and transport of traffic over a network comprising:

storing the available bandwidth capacity of paths in a network in a first router;

receiving a request at the first router from a network node of a second network for a signaled path through the network to a destination node; and

examining the paths by the first router and assigning the signaled path to a path from the first router to the destination node.

2. The method according to claim 1, wherein the request contains a bandwidth requirement for the signaled path, the bandwidth requirement being met by the assigned signaled path.

3. The method according to claim 1, wherein the network is a fiber optic network and each path is a lightpath.

4. The method according to claim 1, wherein the second network is an Internet Protocol (IP) network.

5. The method according to claim 1, further comprising storing the available bandwidth capacity of the paths in a database at the first router.

6. The method according to claim 5, wherein the database comprises a lookup table.

7. The method according to claim 6, wherein the lookup table comprises one of a hash table and a search tree.

8. The method according to claim 1, further comprising storing the available bandwidth capacity of paths in each router, the available bandwidth capacity of paths in the network being exchanged between routers.

9. The method according to claim 8, wherein the available bandwidth capacity of paths in the network are exchanged by LIB agents in each router.

10. The method according to claim 1, wherein the destination node is a router.

11. The method according to claim 1, wherein the assigned path comprises a label switched path (LSP).

12. The method according to claim 1, further comprising determining a list of routers that are close in routing distance to the first router based on a topology of the network.

13. The method according to claim 1, wherein the existing path comprises an existing path from a second router to the destination node through the network, the assigned signaled path comprising a path from the first router to the second router and the existing path from the second router to the destination node.

14. The method according to claim 13, wherein the first router and second router are border routers of one of the network and the second network.

15. The method according to claim 13, wherein the second router is close to the first router in distance.

16. The method according to claim 13, further comprising sending the available bandwidth capacity of paths in the network from the network to the first router.

17. The method according to claim 1, wherein the the assigned signaled path comprising an existing path from the first router to the second router and a path from the second router to the destination node.

18. The method according to claim 17, wherein the second router is close to the destination node in distance.

19. The method according to claim 17, further comprising requesting second router candidates from the destination node.

20. The method according to claim 19, further sending lightpath requests to the second router.

21. The method according to claim 1, wherein the destination node resides in a third network.

22. The method according to claim 1, further comprising assigning the signal path to a path from the first router to the destination node using an existing path to the destination node through the network

23. The method according to claim 1, further comprising assigning the signal path to a path from the first router to the destination node using an existing path from the first router through the network

24. A method for efficient management and transport of traffic over a network comprising:

leaking the available bandwidth capacity of paths in a network to a first router by the network;

receiving a request at the first router from a network node of a second network for a signaled path through the network to a destination node; and

examining paths by the first router and assigning the signaled path to a path from the first router to the destination node.

25. The method according to claim 24, further comprising assigning the signaled path to a path from the first router to the destination node using an existing path from the first router through the network.

26. The method according to claim 24, further comprising assigning the signaled path to a path from the first router to the destination node using an existing path to the destination node through the network.

27. The method according to claim 24, wherein the leaking occurs via an Exterior Gateway Protocol (EGP).

28. The method according to claim 24, further comprising leaking, from the network to the first router, reachability information and distances of other routers from the first router, the reachability information and distances being used by the first router to determine a list of routers that are close in distance to the first router.

29. The method according to claim 24, wherein the network comprises a fiber optic network.

30. The method according to claim 24, wherein the existing path comprises an existing path from a second router to the destination node through the network, the assigned signaled path comprising a path from the first router to the second router and the existing path from the second router to the destination node.

31. The method according to claim 30, wherein the first router and the second router are border routers of one of the first network and the second network.

32. The method according to claim 24, wherein the existing path comprises

an existing path from the first router to a second router through the network, the assigned signaled path comprising the existing path from the first router to the second router and a path from the second router to the destination node.

33. The method according to claim 32, wherein the first router and the second router are border routers of one of the first network and the second network.

34. The method according to claim 31, wherein the second router is close to at least one of the first router and the destination node.

35. The method according to claim 24, wherein the second network comprises an IP network.

36. A method for efficient management and transport of traffic over a network comprising:

receiving a request at a first router from a network node of a second network for a signaled path through a network to a destination node;

requesting information from the network by the first router;

receiving the information by the first router, the information comprising the available bandwidth capacity of paths in a network and a list of routers close to the destination node; and

examining paths by the first router using the information and assigning the signaled path to a path from an intermediate node to the destination node.

37. The method according to claim 36, further comprising assigning the signaled path to a path from the first node to an intermediate node using an existing path to the intermediate node through the network.

38. The method according to claim 36, wherein the network comprises a fiber optic network.

39. The method according to claim 36, wherein the existing path comprises an existing path from the first router to a second router through the network, the assigned signaled path comprising the existing path and a path from the second router to the destination node.

40. The method according to claim 36, wherein the first router and second router are border routers of one of the first network and the second network.

41. The method according to claim 40, wherein the second router is close to the destination node.

42. The method according to claim 36, wherein the second network comprises an IP network.

43. The method according to claim 36, comprising requesting the path information through a user network interface (UNI).

44. A method for efficient management and transport of traffic over a network comprising:

receiving a request at a first router from a network node of a second network for a signaled path through a network to a destination node;

requesting information from the network by the first router;

receiving the information by the first router, the information comprising the available bandwidth capacity of paths in a network; and

examining paths by the first router using the information and assigning the signaled path to a path from the first router to an intermediate node, and aggregating the signaled path to an existing path from the intermediate node to the destination node.

45. The method according to claim 44, further comprising assigning the signaled path to a path from the intermediate node to the destination node using an existing path to the destination node through the network.

46. The method according to claim 44, wherein the existing path comprises an existing path from a second router to the destination node through the network, the assigned signaled path comprising a path from the first router to the second router and the existing path from the second router to the destination node.

47. The method according to claim 44, wherein the second router is close to the first router.

48. A method for efficient management and transport of traffic over a network comprising:

monitoring traffic between the second network through the first network to at least one remote network by a mobile agent at the second network; and

assigning traffic between the second network through the first network to each at least one remote network by the mobile agent to a different one at least one router,

wherein new traffic from the second network to one at least one remote network is assigned to the one at least one router assigned to that one at least one remote network.

49. The method according to claim 48, wherein the first network is a core network, the core network being one of an Asynchronous Transfer Mode (ATM) optical network, a frame-relay network, and an Internet Protocol (IP) core network.

50. The method according to claim 48, wherein the at least one router are border routers.

51. The method according to claim 48, wherein the monitoring comprises monitoring traffic in each destination queue at the second network, each destination queue containing traffic for one at least one remote network.

52. The method according to claim 48, wherein the mobile agent resides at one at least one router.

53. The method according to claim 52, further comprising moving the mobile agent from the one at least one router to another at least one router.

54. The method according to claim 48, wherein the first network is an optical network.

55. The method according to claim 48, wherein the second network and the at least one remote network are Internet Protocol (IP) subnets.

56. The method according to claim 48, further comprising assigning new traffic from the second network to one at least one remote network to another at least one router other than the one at least one router assigned to that one at least one remote network when the one at least one router has a heavy traffic load.

57. The method according to claim 48, further comprising un-assigning one at least one router assigned to one at least one remote network and assigning another at least one router to the one at least one remote network when the another at least one router has a light traffic load.

58. The method according to claim 48, further comprising exchanging the availability bandwidth capacity of all paths in the first network between all at least one router at the second network.

monitoring traffic between the second network through the first network to at least one remote network by a mobile agent at the second network

59. A router comprising:

a database, the database storing information regarding the available bandwidth capacity of all paths in a network;

a decision module, the decision module receiving a request for a path to route traffic through the network and using the information to return a sequence of paths in the network to handle the traffic;

a mapping and aggregation module, the mapping and aggregation module aggregating the traffic to existing paths that have enough bandwidth to carry the traffic;

a lightpath information base (LIB) agent module, the LIB agent module sharing and collecting the information from other routers and performing signaling; and

a routing and wavelength assignment module, the routing and wavelength assignment module computing and selecting paths and assigning wavelengths.

60. The router according to claim 59, further comprising a traffic monitoring module, the traffic monitoring module monitoring the traffic load initiating from a subnet.

61. The router according to claim 60, further comprising a mobile agent selection module, the mobile agent selection module using the results of the

monitoring to one of choose and de-select a router to manage the traffic through the sequence of paths.

62. A system for efficient management and transport of traffic comprising:

a first network, the first network including a source node;

a second network, the second network having a plurality of paths through the second network;

a third network, the third network having a destination node; and

a router operably connected to the first network and the second network, the router receiving a request from the source node for a path through the second network to route traffic from the first network to the destination node at the third network, the router routing the traffic using an existing path to the destination node through the second network.

63. The system according to claim 62, wherein new traffic from the first network to the destination node at the third network is assigned to a router assigned to handle traffic to the destination node at the third network.

64. A system for efficient management and transport of traffic comprising:

a first network, the first network including a source node;

a second network, the second network having a plurality of paths through the second network;

a third network, the third network having a destination node; and

a router operably connected to the first network and the second network, the router receiving a request from the source node for a path through the second network to route traffic from the first network to the destination node at the third network, the router routing the traffic using an existing path from the source node through the second network.